

We claim:

1. A process for preparing polyisobutene having a content of  
5 terminal vinylidene groups of at least 75 mol% by  
polymerizing isobutene or isobutenic hydrocarbon mixtures in  
the liquid phase in the presence of a boron trifluoride  
complex catalyst of the composition  
10  $(BF_3)_a \cdot L^1_b \cdot L^2_c \cdot L^3_d$   
where  
  - 15 -  $L^1$  is water, a primary  $C_1$ - $C_5$ -alkanol and/or a secondary  
 $C_3$ - $C_5$ -alkanol,
  - $L^2$  is at least one aldehyde and/or one ketone,
  - 20 -  $L^3$  is an ether having at least 5 carbon atoms, a  
secondary alkanol having at least 6 carbon atoms, a  
primary alkanol having at least 6 carbon atoms and/or a  
tertiary alkanol,
  - 25 - the b:a ratio is in the range from 0.9 to 3.0,
  - the c:a ratio is in the range from 0.01 to 0.5,
  - the d:a ratio is in the range from 0 to 1.0.
- 30 2. A process as claimed in claim 1, wherein  $L^1$  is selected from  
water, methanol, ethanol, 2-propanol and 1-propanol.
3. A process as claimed in claim 1 or 2, wherein  $L^2$  is selected  
35 from formaldehyde, acetaldehyde, propionaldehyde,  
n-butyraldehyde, isobutyraldehyde, acetone, methyl ethyl  
ketone and diethyl ketone.
4. A process as claimed in claim 1, wherein the d:a ratio is in  
40 the range from 0.1 to 1.
5. A process as claimed in claim 4, wherein  $L^3$  is selected from  
methyl tert-butyl ether, di-n-butyl ether, di-n-hexyl ether  
and dioctyl ether.
- 45 6. A process as claimed in claim 4, wherein  $L^3$  is selected from  
primary alcohols having  $\beta$ -branching.

7. A process as claimed in claim 6, wherein  $L^3$  is selected from 2-ethylhexanol, 2-propylheptanol, the oxo alcohols of dimeric, trimeric and tetrameric propylene, and di- and trimeric butene.

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8. A process as claimed in claim 4, wherein  $L^3$  is tert-butanol.

9. A process as claimed in claim 4, wherein  $L^3$  is selected from n-hexanol and n-octanol.

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10. A process as claimed in any of the preceeding claims for preparing polyisobutene having a number-average molecular weight  $M_n$  of from 500 to 2500 dalton.

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